AMENDMENTS TO THE SPECIFICATION

Pursuant to the "Amendments in a Revised Format Now Permitted" Notice, all amendments to the specification are made by presenting replacement paragraphs, marked up to show changes made relative to the immediate prior version. For ease of location, changes are also electronically highlighted which shows gray when printed.

The following replacement paragraphs are submitted:

1. paragraph commencing at line 22 of page 4:

In all previous PEM fuel cell stack designs, the means for providing fuel gas and oxidizing gas to the reactant channels and for conducting reaction product, fuel gas and oxidizing gas from the reactant channels can be generally divided into two categories: those <u>with</u> internal manifolds and <u>those with</u> external manifolds/plena. Internal manifolds have been almost universally used in preference to external plena or manifolds for proton exchange membrane (PEM) fuel cell stacks. In part this is because hydrogen, which has the smallest atomic structure of all elements and thus is difficult to contain, and which is used at relatively high pressures, can generally be more effectively contained by internal manifolds than by external plena. In internal-manifold fuel cell stacks, the hydrogen is typically provided to the stack via conventional tubing attached to internal manifold ports in the top or bottom end plate. In external-plena PEM fuel cell stacks, the joints between the plena and the fuel cell stack containment means, and the joint between the containment means and the fuel cell stack itself, must be somehow sealed so as to contain the hydrogen, which can be difficult.

2. paragraph commencing at line 34 of page 5:

In conventional external-plena fuel cell stacks, a plenum is typically attached to each of the four sides of the fuel cell stack. Typically, the cooling fluid is also air; and one pair of opposed plena is used to provide fuel gas to one side of the fuel cell stack and exhaust it from an opposite second side, and one pair of opposed plena is used to provide air (for use as an oxidizing gas and a cooling gas) to a third side of the fuel cell stack and exhaust it from an opposite fourth side. In some such conventional external-plena fuel cell stacks some portion of the dual-function air thus provided passes through narrow oxidant channels and a much larger portion, typically five to ten times larger, passes through wider cooling channels. In many such conventional external-plena fuel cell stacks only one set of air channels is used to both provide oxidant to the MEA layer and to cool the fuel cell stack. One problem with both of these dual-function-air configurations is that, for optimum fuel cell efficiency, all of the dual-function air must be humidified so that the small portion of the air that contacts the MEA layer, does not dehydrate the MEA layer. Although the water can be recovered from the air exhausted from such fuel cell stacks, the large volume of the dual-function air makes this inefficient and typically such fuel cell stacks contain a water reservoir to which water must be added from time to time to replace the water carried away ~~be~~ by the exhausted dual-function air.

3. paragraph commencing at line 33 of page 10:

A cage design of the foregoing sort is capable of providing reliable structural integrity and substantial rigidity ~~of~~ to the fuel cell stack assembly. This cage design also separates the function of maintenance of alignment of the fuel cell components from the function of compression of the fuel cell stack, permitting reliable alignment and compression control, especially as compared to conventional fuel cell stack containment means of the rod-and-plate type mentioned above. In the preferred embodiment of the present invention, as the cage is rigid and the L-shaped struts maintain the alignment of the fuel cell components, the compressive force to be exerted on the fuel cell stack can be determined solely on the basis of the need to

maintain proper electrical contact and prevent leaks from between the fuel cell stack components.

4. paragraph commencing at line 20 of page 16:

The top end of each strut 32 includes means for attaching the strut 32 to the top end plate 26. In the embodiment shown in the drawings, the means for attaching the struts 32 to the top end plate 26 comprises: a strut brace 48 at the top end of each strut 32, being relatively massive ends having a longitudinally-extending threaded strut socket 50; a brace bolt hole 52 proximate to each corner of the top end plate 26 (Fig. 6); and four brace bolts 54. The brace bolts 54 are inserted through the brace bolt holes 52 and screwed into the strut sockets 50, to attach the struts 32 to the top end plates 26. As shown in Fig. 7, the corners of the pressure plate 28 have rounded notches 55 so as to fit between the strut braces 48.

5. paragraph commencing at line 35 of page 18:

Each cooling-air plate 78 has a cooling-air flow field 90 comprising a plurality of cooling-air channels 92. Each cooling-air channel 92 has an opening at each side of the respective cooling-air plate 78 and extends the width of the cooling-air plate 78. The cooling-air channels 92 can be open to either an adjoining fuel-gas plate 74 or an adjoining oxidant-air plate 76, or both, in the case of a bipolar cooling-air plate (not shown). In the embodiment shown in the drawings, the cooling-air channels 92 are linear, in that they are straight channels extending the width of the cooling-air plates 78. It will be clear that the cooling-air channels 92 need not be linear and that numerous other configurations of the cooling-air channels 92 are possible including configurations that provide increased turbulence in the cooling air as compared to linear channels.~~,~~ Cooling air provided to one side of the cooling-air plates 78 flows through the cooling-air channels 92, across the width of the cooling-air plates 78, to the other side of the cooling-air plates 76.